CLAIMS

1. A method for assaying an ore sample to determine the concentration of selected metals therein, comprising the steps of:

combining the prepared ore sample with a lead-containing flux in a receptacle;

inductively heating the combination to form a fusion of slag and lead containing the metals in the sample; and

separating the lead from the slag. ← how is conc. of metals determined?

2. The method according to claim 1 wherein the combination is heated at a predetermined temperature profile.

3. The method according to claim 2 wherein the predetermined reference temperature profile is determined by the characteristics and amount of the ore sample and/or the flux.

4. The method according to claim 3 wherein the sample is supplied with a high level of heat for a predetermined first period of time and then supplied with a lower level of heat for a predetermined second period of time to form the fusion of slag and lead.

5. The method according to any one of the preceding claims wherein the sample of ore and flux are combined in a container made from carbon-based material, and the container, the sample and the flux are inductively heated.

6. The method according to claim 5 wherein the container is made from plastics material and comprises a lid which is arranged to close the container sealingly. 5 already states container made from carbon-base material

7. The method according to claim 5 or 6 wherein the container includes identification means for identifying the sample contained therein.

8. The method according to claim 7 wherein the identification means is a barcode.

9. A method according to any one of the preceding claims wherein the flux contains sodium hydroxide.

10. The method according to any one of the preceding claims wherein the sample is heated inductively within a graphite melting pot [receptacle] in an induction furnace.

11. The method according to any one of the preceding claims wherein the sample is heated inductively within a zirconium melting pot [receptacle] in an induction furnace.

12. The method according to any one of the preceding claims wherein molten lead separated from the slag is poured into a chilled mould, to provide a solid lead button.

13. A method according to claim 5 including the steps of storing information on each sample on a central database, providing each container into which the sample is poured with a unique identification means.

identifying each container before inserting it into the induction furnace, correlating the identity of the container and information on the central database, and applying a predetermined reference temperature profile to the sample, according to the information on the sample stored in the database.

14. A method according to claim 13 wherein the identification means is a bar code and the bar code is identified with a scanner.

15. A method according to any one of the preceding claims wherein each solid lead button is stamped with an identification code.

16. A receptacle for use in a method for assaying an ore sample according to claim 1, the receptacle comprising a base with a side wall extending from the base, the side wall defining a top opening into the receptacle, and the side wall having a collecting cavity, wherein the collecting cavity is sized to collect a predetermined amount of molten lead.

17. A receptacle for use in a method for assaying an ore sample according to claim 16 wherein the collecting cavity is located proximate the top opening of the receptacle.

18. A receptacle for use in a method for assaying an ore sample according to claim 16 or 17 wherein barrier means is provided between the collecting cavity and the opening of the receptacle, to trap molten lead in the collecting cavity.

19. A receptacle for use in a method for assaying an ore sample according to

any one of claims 16 to 18 wherein the collecting cavity is formed within a removable plug which is attachable to the side wall of the receptacle.

20. A receptacle for use in a method for assaying an ore sample according to any one of claims 16 to 19 including a first spout located at the top opening, above the collecting cavity.

21. A receptacle for use in a method for assaying an ore sample according to claim 20 including a second spout located at the top opening, diametrically opposed to the first spout.

22. A receptacle for use in a method for assaying an ore sample according to any one of claims 16 to 21 wherein the receptacle is also a melting pot for an induction furnace.

23. A receptacle for use in a method for assaying an ore sample according to any one of claims 16 to 22 made from graphite.

24. A method for separating molten lead from slag, in the receptacle of claim 16, the method including the steps of:

1. introducing a slag with a predetermined amount of molten lead therein into the receptacle;

2. rotating the receptacle in a first direction toward the collecting cavity so that the molten lead fills and is retained within the cavity, rotating the receptacle further so that the slag is discharged from the opening to the receptacle;

3. rotating the receptacle so that the molten lead flows out of the opening to the receptacle; and
4. collecting the lead discharged from the opening of the receptacle.

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25. ~~8.~~ A method according to claim 24 wherein the receptacle is a melting pot surrounded by an electromagnetic coil and the electromagnetic coil is rotated together with the melting pot.

26. A flux composition for use in a method for assaying an ore sample according to claim 1, the flux composition containing sodium hydroxide.

27. A flux composition for use in a method for assaying an ore sample according to claim 26, comprising 20% to 60%, by weight, sodium hydroxide.

28. A flux composition for a method for assaying an ore sample according to any one of claims 26 to 27 further comprising:

20% to 60%, by weight, lead oxide; and
20% to 60%, by weight, borax.

29. A flux composition for use in a method for assaying an ore sample according to claim 27 comprising 20% to 50%, by weight sodium hydroxide, 25% to 40% lead oxide and 25% to 40% borax.

30. A flux composition for use in a method for assaying an ore sample

according to any one of claims 26 to 29 further including silver nitrate.

31. A sealed container, for use in a method for assaying in an ore sample according to claim 5, the sealed container made from a carbon-based sodium carbonate.

32. A sealed container for use in a method for assaying an ore sample according to claim 31 including a replaceable lid.

33. A sealed container for use in a method for assaying an ore sample according to claim 31 or 32 made from a combustible material.

34. A sealed container for use in a method for assaying an ore sample according to claim 33 made from a plastics material.

35. A sealed container for use in a method for assaying an ore sample according to claim 34 made from a mixture of plastics material and a flux material.

36. A sealed container for use in a method for assaying an ore sample according to claim 35 wherein the flux material is calcium carbonate.

37. A [sealed container for use in a method for assaying an ore sample according to claim 36, the mixture including 60 to 80%, by weight, calcium carbonate.